What is claimed:

1. An audio-signal circuit, comprising:

a 4^{th}-order low-pass filter circuit having a first phase response and operable to receive and filter an audio signal and to generate a first output signal;

a 4^{th}-order band-pass filter circuit having a second phase response substantially equal to the first phase response and operable to receive and filter the audio signal to generate a second output signal;

a 4^{th}-order high-pass filter circuit having a third phase response substantially equal to the first and second phase responses and operable to receive and filter the audio signal to generate a third output signal; and

a combining circuit coupled to the low-pass, band-pass, and high-pass filter circuits and operable to combine the first, second, and third output signals into a combined signal.

2. The audio-signal circuit of claim 1 wherein the low-pass, band-pass, and high-pass filter circuits each have a Linkwitz-Riley alignment.

3. The audio-signal circuit of claim 1 wherein:

the low-pass filter circuit has a first cutoff frequency;

the band-pass filter circuit has the first cutoff frequency and has a second cutoff frequency that is higher than the first cutoff frequency; and

the high-pass filter circuit has the second cutoff frequency.

4. The audio-signal circuit of claim 1 wherein:

the low-pass filter circuit has a first cutoff frequency and a first gain that is –6dB at the first cutoff frequency;

the band-pass filter circuit has the first cutoff frequency, a second cutoff frequency that is higher than the first cutoff frequency, and a second gain that is –6dB at the first and second cutoff frequencies; and

the high-pass filter circuit has the second cutoff frequency and a third gain that is –6dB at the second cutoff frequency.

5. The audio-signal circuit of claim 1 wherein:

the low-pass filter circuit has a gain of approximately –40dB at 100 Hz; and

the high-pass filter circuit has a gain of approximately –40dB at 12 kHz.

6. The audio-signal circuit of claim 1 wherein:

the low-pass, band-pass, and high-pass filter circuits have respective first, second, and third gains; and

the first, second, and third phase responses of the low-pass, band-pass, and high-pass filter circuits are respectively independent of the first, second, and third gains.

7. The audio-signal circuit of claim 1 wherein the combining circuit is operable to sum together the first, second, and third output signals to generate the combined signal.

8. The audio-signal circuit of claim 1 wherein the low-pass, band-pass, and high-pass filter circuits comprise respective digital filters.

9. An audio-signal circuit, comprising:

audio input and output terminals;

a first series combination of two 2^{nd}-order low-pass filters, the series combination having a first phase response, an input terminal coupled to the audio input terminal, and an output terminal;

a second series combination of two 2^{nd}-order low-pass filters and two 2^{nd}-order high-pass filters, the second series combination having a second phase response substantially equal to the first phase response, an input terminal coupled to the audio input terminal, and an output terminal;

a third series combination of two 2^{nd}-order high-pass filters, the third series combination having a third phase response substantially equal to the first and second phase responses, an input terminal coupled to the audio input terminal, and an output terminal; and

a combining circuit having first, second, and third input terminals respectively coupled to the output terminals of the first, second, and third series combinations and having an output terminal coupled to the audio output terminal.

10. The audio-signal circuit of claim 9 wherein each filter of the first, second, and third series combinations has a Butterworth alignment.

11. The audio-signal circuit of claim 9 wherein the first series combination of the low-pass filters, the combination of the two low-pass filters and the combination of the two high-pass filters in the second series combination, and the third series combination of the high-pass filters each have a Linkwitz-Riley alignment.

12. The audio-signal circuit of claim 9 wherein:

the first series combination has a first cutoff frequency;

the second series combination has the first cutoff frequency and has a second cutoff frequency that is higher than the first cutoff frequency; and

the third series combination has the second cutoff frequency.

13. The audio-signal circuit of claim 9 wherein:

the first series combination has a cutoff frequency within a first range of approximately 250 – 400 Hz;

the second series combination has a first cutoff frequency within the first range and has a second cutoff frequency within a second range of approximately 3 – 5 kHz; and

the third series combination has a cutoff frequency within the second range.

14. The audio-signal circuit of claim 9 wherein:

the first series combination has a cutoff frequency of approximately 300 Hz;

the second series combination has a first cutoff frequency of approximately 300 Hz and has a second cutoff frequency of approximately 4 kHz; and

the third series combination has a cutoff frequency of approximately 4 kHz.

15. The audio-signal circuit of claim 9 wherein:

the first series combination has a first cutoff frequency and a first gain that is –6dB at the first cutoff frequency;

the second series combination has the first cutoff frequency, a second cutoff frequency that is higher than the first cutoff frequency, and a second gain that is –6dB at the first and second cutoff frequencies; and

the third series combination has the second cutoff frequency and a third gain that is –6dB at the second cutoff frequency.

16. The audio-signal circuit of claim 9 wherein:

the first series combination has a gain of approximately –40dB at 100 Hz; and

the third series combination has a gain of approximately –40dB at 12 kHz.

17. The audio-signal circuit of claim 9 wherein:

the first series combination includes a gain control coupled in series with its two low-pass filters; and

the third series combination includes a gain control coupled in series with its two high-pass filters.

18. The audio-signal circuit of claim 9 wherein the second series combination includes a gain control coupled in series with its two low-pass and two high-pass filters.

19. The audio-signal circuit of claim 9 wherein each filter of the first, second, and third series combinations has a Sallen and Key topology.

20. The audio-signal circuit of claim 9 wherein:

the first, second, and third series combinations have respective first, second, and third gains; and

the first, second, and third phase responses of the first, second, and third series combinations are respectively independent of the first, second, and third gains.

21. The audio-signal circuit of claim 9 wherein the combining circuit comprises a summer.

22. The audio-signal circuit of claim 9 wherein the two 2^{nd}-order low-pass filters of the first series combination, the two 2^{nd}-order low-pass filters and the two 2^{nd}-order high-pass filters of the second series combination, and the two 2^{nd}-order high-pass filters of the third series combination comprise respective digital filters.

23. An audio-signal circuit, comprising:

a 2^{nd}-order low-pass filter circuit having a first phase response and operable to receive and filter an audio signal and to generate a first output signal;

a 2^{nd}-order band-pass filter circuit having a second phase response substantially equal to the first phase response and operable to receive and filter the audio signal to generate a second output signal;

a 2^{nd}-order high-pass filter circuit having a third phase response substantially equal to the first and second phase responses and operable to receive and filter the audio signal to generate a third output signal; and

a combining circuit coupled to the low-pass, band-pass, and high-pass filter circuits and operable to combine the first, second, and third output signals into a combined signal.

24. The audio-signal circuit of claim 23 wherein the low-pass, band-pass, and high-pass filter circuits each have a Linkwitz-Riley alignment.

25. The audio-signal circuit of claim 23 wherein:

the low-pass filter circuit has a first cutoff frequency;

the band-pass filter circuit has the first cutoff frequency and has a second cutoff frequency that is higher than the first cutoff frequency; and

the high-pass filter circuit has the second cutoff frequency.

26. The audio-signal circuit of claim 23 wherein:

the low-pass filter circuit has a first cutoff frequency and a first gain that is –6dB at the first cutoff frequency;

the band-pass filter circuit has the first cutoff frequency, a second cutoff frequency that is higher than the first cutoff frequency, and a second gain that is –6dB at the first and second cutoff frequencies; and

the high-pass filter circuit has the second cutoff frequency and a third gain that is –6dB at the second cutoff frequency.

27. The audio-signal circuit of claim 23 wherein:

the low-pass filter circuit has a gain of approximately –20dB at 100 Hz; and

the high-pass filter circuit has a gain of approximately –20dB at 12 kHz.

28. The audio-signal circuit of claim 23 wherein:

the low-pass, band-pass, and high-pass filter circuits have respective first, second, and third gains; and

the first, second, and third phase responses of the low-pass, band-pass, and high-pass filter circuits are respectively independent of the first, second, and third gains.

29. The audio-signal circuit of claim 23 wherein the combining circuit is operable to sum together the first, second, and third output signals to generate the combined signal.

30. The audio-signal circuit of claim 23 wherein:

the low-pass filter circuit comprises a 2^{nd}-order low-pass filter;

the band-pass filter circuit comprises a series combination of a 2^{nd}-order low-pass filter and a 2^{nd}-order high-pass filter; and

the high-pass filter circuit comprises a 2^{nd}-order high-pass filter.

31. The audio-signal circuit of claim 23 wherein the low-pass, band-pass, and high-pass filter circuits comprise respective digital filters.

32. An audio-signal circuit, comprising:

audio input and output terminals;

a 2nd-order low-pass filter that has a first phase response, an input terminal coupled to the audio input terminal, and an output terminal;

a series combination of a 2nd-order low-pass filter and a 2nd-order high-pass filter, the series combination having a second phase response substantially equal to the first phase response, an input terminal coupled to the audio input terminal, and an output terminal; and

a 2nd-order high-pass filter that has a third phase response substantially equal to the first and second phase responses, an input terminal coupled to the audio input terminal, and an output terminal; and

a combining circuit having first, second, and third input terminals respectively coupled to the output terminals of the low-pass filter, series combination of low-pass and high-pass filters, and high-pass filter and having an output terminal coupled to the audio output terminal.

33. The audio-signal circuit of claim 32 wherein:

the low-pass filter, the low-pass and high-pass filters of the series combination, and the high-pass filter each have a Linkwitz-Riley alignment.

34. The audio-signal circuit of claim 32 wherein:

the low-pass filter, the low-pass and high-pass filters of the series combination, and the high-pass filter each have a Linkwitz-Riley alignment; and

one of the low-pass and high-pass filters of the series combination has an inverting topology.

35. The audio-signal circuit of claim 32 wherein:

the low-pass filter, the low-pass and high-pass filters of the series combination, and the high-pass filter each have a Linkwitz-Riley alignment; and

one of the low-pass and high-pass filters of the series combination has an inverting multiple-feedback topology.

36. The audio-signal circuit of claim 32 wherein:

the low-pass filter has a first cutoff frequency;

the series combination of the low-pass and high-pass filters has the first cutoff frequency and has a second cutoff frequency that is higher than the first cutoff frequency; and

the high-pass filter has the second cutoff frequency.

37. The audio-signal circuit of claim 32 wherein:

the low-pass filter has a cutoff frequency within a first range of approximately 250 – 400 Hz;

the series combination of the low-pass and high-pass filters has a first cutoff frequency within the first range and has a second cutoff frequency within a second range of approximately 3 – 5 kHz; and

the high-pass filter has a cutoff frequency within the second range.

38. The audio-signal circuit of claim 32 wherein:

the low-pass filter circuit has a cutoff frequency of approximately 300 Hz;

the series combination of the low-pass and high-pass filters has a first cutoff frequency of approximately 300 Hz and has a second cutoff frequency of approximately 4 kHz; and

the high-pass filter has a cutoff frequency of approximately 4 kHz.

39. The audio-signal circuit of claim 32 wherein:

the low-pass filter has a first cutoff frequency and a first gain that is –6dB at the first cutoff frequency;

the series combination of the low-pass and high-pass filters has the first cutoff frequency, a second cutoff frequency that is higher than the first cutoff frequency, and a second gain that is –6dB at the first and second cutoff frequencies; and

the high-pass filter circuit has the second cutoff frequency and a third gain that is –6dB at the second cutoff frequency.

40. The audio-signal circuit of claim 32 wherein:

the low-pass filter has a gain of approximately –20dB at 100 Hz; and

the high-pass filter has a gain of approximately –20dB at 12 kHz.

41. The audio-signal circuit of claim 32, further comprising:

a low-pass gain control coupled in series with the low-pass filter; and

a high-pass gain control coupled in series with the high-pass filter.

42. The audio-signal circuit of claim 32, further comprising a gain control coupled in series with the low-pass and high-pass filters of the series combination.

43. The audio-signal circuit of claim 32 wherein each of the low-pass and high-pass filters and one of the filters of the series combination has a Sallen and Key topology.

44. The audio-signal circuit of claim 32 wherein:

the low-pass, high-pass, and series combination of low-pass and high-pass filters have respective first, second, and third gains; and

the first, second, and third phase responses are respectively independent of the first, second, and third gains.

45. The audio-signal circuit of claim 32 wherein the combining circuit comprises a summing circuit.

46. The audio-signal circuit of claim 32 wherein the low-pass filter, the low-pass and high-pass filters of the series combination, and the high-pass filter comprise respective digital filters.

47. An audio circuit, comprising:

an analog-to-digital converter operable to receive an analog audio signal having a range of frequencies and to convert the analog signal into a digital audio signal;

a processor coupled to the converter, operable to filter the digital audio signal, operable to generate first, second, and third filtered digital signals that each include respective first, second, and third portions of the range of frequencies of the audio signal, and operable to combine the first, second, and third filtered digital signals into a combined filtered digital signal; and

a digital-to-analog converter coupled to the processor and operable to convert the combined filtered digital signal into a combined filtered analog signal.

48. The audio circuit of claim 47 wherein the processor is operable to generate the first, second, and third filtered digital signals by filtering the digital audio signal with first, second, and third 2^{nd}-order filter functions.

49. The audio circuit of claim 47 wherein the processor is operable to generate the first, second, and third filtered digital signals by filtering the digital audio signal with first, second, and third 4^{th}-order filter functions.

50. The audio circuit of claim 47 wherein the first, second, and third filtered digital signals respectively comprise the bass-band, mid-band, and treble-band portions of the audio signal.

51. A method, comprising:

filtering an audio signal with a 4^{th}-order low-pass filter circuit to generate a first output signal, the low-pass filter having a first phase response;

filtering the audio signal with a 4^{th}-order band-pass filter circuit to generate a second output signal, the band-pass filter circuit having a second phase response substantially equal to the first phase response;

filtering the audio signal with a 4^{th}-order high-pass filter to generate a third output signal, the high-pass filter circuit having a third phase response substantially equal to the first and second phase responses; and

combining the first, second, and third output signals into a combined signal.

52. The method of claim 51 wherein each of the low-pass, band-pass, and high-pass filter circuits has a Linkwitz-Riley alignment.

53. The method of claim 51, further comprising changing the respective gains of the low-pass and high-pass filter circuits without significantly changing the first and third phase responses.

54. The method of claim 51, further comprising changing the gain of the band-pass filter circuit without significantly changing the second phase response.

55. The method of claim 51, further comprising simultaneously filtering the audio signal with the low-pass, band-pass, and high-pass filter circuits.

56. The method of claim 51 wherein the combining comprises summing together the first, second, and third output signals to generate the combined signal.

57. The method of claim 51 wherein the low-pass, band-pass, and high-pass filters comprise analog filtering circuitry.

58. The method of claim 51 wherein the low-pass, band-pass, and high-pass filters comprise digital filtering circuitry.

59. A method, comprising:

filtering an audio signal with a 2^{nd}-order low-pass filter circuit to generate a first output signal, the low-pass filter having a first phase response;

filtering the audio signal with a 2^{nd}-order band-pass filter circuit to generate a second output signal, the band-pass filter circuit having a second phase response substantially equal to the first phase response;

filtering the audio signal with a 2^{nd}-order high-pass filter to generate a third output signal, the high-pass filter circuit having a third phase response substantially equal to the first and second phase responses; and

combining the first, second, and third output signals into a combined signal.

60. The method of claim 59 wherein each of the low-pass, band-pass, and high-pass filter circuits has a Linkwitz-Riley alignment.

61. The method of claim 59, further comprising changing the respective gains of the low-pass and high-pass filter circuits without significantly changing the first and third phase responses.

62. The method of claim 59, further comprising changing the gain of the band-pass filter circuit without significantly changing the second phase response.

63. The method of claim 59, further comprising simultaneously filtering the audio signal with the low-pass, band-pass, and high-pass filter circuits.

64. The method of claim 59 wherein the combining comprises summing together the first, second, and third output signals to generate the combined signal.

65. The method of claim 59 wherein the low-pass, band-pass, and high-pass filters comprise analog filtering circuitry.

66. The method of claim 59 wherein the low-pass, band-pass, and high-pass filters comprise digital filtering circuitry.